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# Classification of Vegetable Crops

There are about 10,000 plant species that are used as vegetables the world over. Of these, about fifty plant species or so are commercially important. It is therefore, important to classify vegetables into groups or classes to better understand or discuss them. Vegetables that share some characteristics are grouped together. There are different ways of classifying vegetable crops but none of these methods would satisfy completely the different groups like farmers, consumers, academics etc. Broadly there are five methods of classifying vegetables. These include;

1. Botanical classification
2. Classification based on hardiness or temperature
3. Classification based on plant part used
4. Classification based on culture
5. Classification based on life cycle

## **2.1. BOTANICAL CLASSIFICATION**

This is the only method of classifying crop plants, which is universally accepted. Linnaeus, a renowned taxonomist was the first to give binomial classification in plants and animals. The classification is based on morphological and cytological similarities and dissimilarities, place of origin, crossability behaviour, floral biology etc. The successive levels of morphological relationships are a result of evolution. Botanical classification involves grouping of plants

into kingdom, division, sub-division, phylum, sub-phylum, class, sub-class, order, family, genera, species, sub-species and variety. The broadest group in which vegetables are discussed is family. The genus and species constitute the scientific name. Scientific names are accepted worldwide and there cannot be any confusion as per their nomenclature. This classification is useful to students of Olericulture and academicians but is of little value to the grower. For example, potato and tomato though belong to the same botanical family but have entirely different cultural requirements. Therefore, a potato farmer may find it difficult to grow tomato. On the other hand carrot and radish belong to the different botanical families but require similar cultural requirements.

All vegetable crops belong to the division Angiospermae. The division Angiospermae has two classes.

Class I: Monocotyledoneae

Class II: Dicotyledoneae

Most vegetables belong to the class Dicotyledoneae. A list of vegetables belonging to class, family, genus, species, subspecies or botanical variety and their common English names are given in Table 2.1.

**TABLE 2.1. Class, family, genus, species, subspecies or botanical variety and the common English names of vegetable crops**

Family	Botanical name	English name
Class Monocotyledoneae		
Gramineae	<i>Zea mays</i> var. <i>rugosa</i>	sweet corn
Alliaceae	<i>Allium cepa</i>	onion
	<i>Allium cepa</i> var. <i>aggregatum</i>	multiplier onion
	<i>Allium porrum</i>	leek
	<i>Allium sativum</i>	garlic
	<i>Allium fistulosum</i>	Welsh onion
	<i>Allium ascalonicum</i>	shallot
	<i>Allium schoenoprasum</i>	chive
Liliaceae	<i>Asparagus officinalis</i>	asparagus
Araceae	<i>Colocasia esculenta</i>	arvi or taro
Dioscoreaceae	<i>Dioscorea esculenta</i>	lesser yam
	<i>Dioscorea rotundata</i>	greater yam
	<i>Dioscorea alata</i>	white yam
Class Dicotyledoneae		
Aizoaceae	<i>Tetragonia expansa</i>	New Zealand spinach
Chenopodiaceae	<i>Beta vulgaris</i> var. <i>bengalensis</i>	leaf beet
	<i>Beta vulgaris</i> var. <i>cicla</i>	chard
	<i>Spinacia oleracea</i>	spinach
	<i>Beta vulgaris</i>	beetroot

Compositae	<i>Lactuca sativa</i>	lettuce	
	<i>Lactuca sativa</i> var. <i>capitata</i>	head lettuce	
	<i>Cichorium intybus</i>	chicory	
	<i>Cichorium endivia</i>	endive	
	<i>Cynara scolymus</i>	artichoke	
Convolvulaceae	<i>Ipomoea batatas</i>	sweetpotato	
Cruciferae	<i>Brassica oleracea</i> var. <i>capitata</i>	cabbage	
	<i>Brassica oleracea</i> var. <i>botrytis</i>	cauliflower	
	<i>Brassica oleracea</i> var. <i>gemmifera</i>	Brussels sprouts	
	<i>Brassica oleracea</i> var. <i>italica</i>	sprouting broccoli	
	<i>Brassica oleracea</i> var. <i>acephala</i>	kale	
	<i>Brassica oleracea</i> var. <i>gongylodes</i>	kohlrabi or knol-khol	
	<i>Brassica napus</i> var. <i>napobrassica</i>	rutabaga	
	<i>Brassica campestris</i> var. <i>rapa</i>	turnip	
	<i>Brassica chinensis</i>	Chinese cabbage	
	<i>Raphanus sativus</i>	radish	
	<i>Raphanus sativus</i> var. <i>mougri</i>	rat tail/ mougri radish	
	<i>Armoracia rusticana</i>	horse radish	
	Cucurbitaceae	<i>Cucurbita moschata</i>	pumpkin
		<i>Cucurbita pepo</i>	summer squash
<i>Cucurbita maxima</i>		winter squash	
<i>Citrullus lanatus</i>		watermelon	
<i>Praecitrullus fistulosus</i>		roundmelon	
<i>Cucumis sativus</i>		cucumber	
<i>Cucumis melo</i>		muskmelon	
<i>Cucumis anguria</i>		West Indian gherkin	
<i>Cucumis melo</i> var. <i>flexuosus</i>		longmelon	
<i>Luffa acutangula</i>		ridge gourd	
<i>Luffa cylindrica</i>		sponge gourd	
<i>Lagenaria siceraria</i>		bottle gourd	
<i>Momordica charantia</i>		bitter gourd	
<i>Trichosanthes dioica</i>		pointed gourd	
<i>Trichosanthes anguina</i>		snake gourd	
<i>Scchium edule</i>		chayote or cho-cho	
<i>Coccania grandis</i>		ivy gourd	
Euphorbiaceae	<i>Manihot esculenta</i>	tapioca or cassava	

Fabaceae	<i>Pisum sativum</i>	pea	
	<i>Phaseolus vulgaris</i>	French bean	
	<i>Phaseolus lunatus</i>	Lima bean	
	<i>Vicia faba</i>	broad bean	
	<i>Vigna unguiculata</i>	cowpea, Southern pea	
	<i>Vigna unguiculata</i> var. <i>sesquipedalis</i>	asparagus bean	
	<i>Cyamopsis tetragonoloba</i>	cluster bean	
	<i>Dolichos lablab</i>	Dolichos bean	
	<i>Psophocarpus tetragonolobus</i>	winged bean	
	<i>Glycine max</i>	soybean	
	<i>Trigonella foenum-graecum</i>	fenugreek	
	Malvaceae	<i>Abelmoschus esculentus</i>	okra or lady's finger
	Polygonaceae	<i>Rheum raphaniticum</i>	rhubarb
Solanaceae	<i>Solanum tuberosum</i>	potato or Irish potato	
	<i>Solanum melongena</i>	eggplant or brinjal	
	<i>Solanum lycopersicum</i>	tomato	
	<i>Capsicum annuum</i>	chilli or hot pepper	
	<i>C. annuum</i> var. <i>grossum</i>	Bell pepper or sweet pepper	
Apiaceae	<i>Daucus carota</i>	carrot	
	<i>Petroselinum crispum</i>	parsley	
	<i>Apium graveolens</i>	celery	
	<i>Pastinaca sativa</i>	parsnip	

## 2.2. CLASSIFICATION BASED ON HARDINESS OR TEMPERATURE

This classification is based on the ability of crop plants to tolerate frost. Hardy crops are those, which can tolerate frost. These are essentially winter season/cool season/temperate crops and are adapted to mean monthly temperature of 15-18°C. These crops can further be divided into two sub-groups viz., hardy or tolerant vegetables and semi-hardy or semi-tolerant vegetables. Some of the hardy crops like asparagus and rhubarb can tolerate even freezing temperature. Non-hardy crops or the summer season crops like cucurbits thrive best under high temperature (20-27°C) and are intolerant to frost. Warm season crops can further be divided into two groups viz. tender or sensitive vegetables and very tender or very sensitive vegetables. Based upon the hardiness, vegetable crops are divided into the following groups.

### 2.2.1. Winter Season Vegetables

**2.2.1.1. Hardy/tolerant vegetables**—these include asparagus, broccoli, Brussels sprouts, cabbage, chive, collard, garlic, kale, knol-khol, leek, onion, parsley, pea, radish, rhubarb, spinach and turnip.

**2.2.1.2. Semi-hardy/ semi-tolerant vegetables**—these include carrot, cauliflower, Chinese cabbage, celery, globe artichoke, lettuce, leaf beet, parsnip and potato.

### 2.2.2. Summer Season Vegetables

**2.2.2.1. Tender/ sensitive vegetables**—these include chilli, tomato, snap bean and sweet corn.

**2.2.2.2. Very tender/ very sensitive vegetables**—these include amaranth, okra, eggplant, bell pepper, tapioca, chilli, cluster bean, Lima bean, colocasia, cowpea, cucurbits, sweetpotato and yam.

## 2.3. CLASSIFICATION BASED ON PLANT PART USED

This classification is important from the consumer and post-harvest handling point of view. For example, leafy vegetables are highly perishable and cannot be stored for longer periods. After harvest, they have to be immediately cooled and stored under ambient temperature conditions to preserve quality. On the other hand tubers and bulbs can be stored at room temperature for a considerable period without losing quality. On the basis of edible plant part, vegetables can be classified into the following groups;

**2.3.1. Leaves;** cabbage, lettuce, spinach, leaf beet, amaranth, fenugreek etc.

**2.3.2. Stem;** knol-khol, asparagus, celery, cauliflower (hypocotyl branches) etc.

**2.3.3. Fruits;** cucurbits, tomato, eggplant, chilli, bell pepper etc.

**2.3.4. Pods;** snap pea, snow pea, beans, okra etc.

**2.3.5. Flowers;** sprouting broccoli, globe artichoke.

**2.3.6. Roots;** radish, turnip, carrot, beetroot, yam, rutabaga, parsnip etc.

**2.3.7. Bulbs;** onion, garlic, leek etc.

**2.3.9. Tubers;** potato, sweetpotato, cassava, taro.

**2.3.10. Seeds;** pea.

## 2.4. CLASSIFICATION BASED ON CULTURE

In this classification, all vegetable crops requiring similar cultural requirements are grouped together. This method of classification is of much practical value for farmers and students of Olericulture. Based on their cultural and climatic requirements, vegetables are divided into the following groups;

**2.4.1. Cole crops;** these crops belong to the family Cruciferae and are also called crucifers or Brassicas. These are winter season and transplanted crops. The crops include cauliflower, cabbage, knol-khol, Chinese cabbage, sprouting broccoli and Brussels sprouts etc.

**2.4.2. Leafy vegetables;** all vegetables belonging to this group are direct seeded crops and include spinach, leaf beet, coriander, fenugreek, amaranth, Swiss chard etc.

**2.4.3. Salad vegetables;** these crops are mainly eaten raw and include lettuce, celery, chicory and parsley.

**2.4.4. Root vegetables;** these crops have prominent and fleshy underground structures and are direct sown winter season crops. These include radish, carrot, turnip, beetroot, parsnip, rutabaga etc.

**2.4.5. Cucurbit crops;** these crops belong to Cucurbitaceae commonly known as the gourd family. The plants have tendrils and produce fleshy fruits. These are direct seeded summer season crops and include melons, gourds, cucumber, pumpkin and summer squash.

**2.4.6. Solanaceous crops;** these belong to Solanaceae commonly known as the nightshade family and are summer season transplanted crops. These include tomato, chilli, bell pepper and eggplant.

**2.4.7. Pea and beans** (pod vegetables); these are legume vegetables and belong to Fabaceae or the pea family. These are directly seeded vegetables and include pea, French bean, Dolichos bean, broad bean, cluster bean, Lima bean, winged bean and cowpea.

**2.4.8. Bulb vegetables;** these are species of *Allium* and belong to the family Alliaceae. These are winter season crops and include onion, leek, garlic, etc.

**2.4.9. Perennial vegetables;** these crops remain in the field for more than two years and include asparagus, artichoke, Jerusalem artichoke, chayote, ivy gourd and pointed gourd.

**2.4.10. Tuber vegetables;** these include potato, sweetpotato, taro, cassava/ tapioca, yams.

**2.4.11. Okra** is represented by an independent group.

## 2.5. CLASSIFICATION BASED ON LIFE CYCLE

All vegetables can be classified into three groups viz. annuals, biennials and perennials, depending upon the time required to complete their life cycle. Most vegetables are annuals. Annual vegetables complete their life cycle in a single growing season. Biennials require two growing seasons. In one season they complete their vegetative growth and in the second season, they complete their reproductive phase. Perennial vegetables grow for more than two years and can be retained for economic yields even up to 15 years. The examples in the three groups are;

**2.5.1. Annual vegetables;** pea, beans, tomato, okra, eggplant, chilli, bell pepper, cucurbits etc.

**2.5.2. Biennial vegetables;** cole crops, bulb crops, root crops etc.

**2.5.3. Perennial vegetables.** asparagus, artichoke, Jerusalem artichoke and pointed gourd.

## WWW SUGGESTED WEB SITES

1. <http://oregonstate.edu/dept/hort/233/classification.htm>